Dell® PowerEdge® Expandable RAID Controller
Controller
Battery Backup Module Guide

Dell® PowerEdge® Expandable RAID Controller

Information in this document is subject to change without notice.

Part Number   58296

The PowerEdge Battery Pack Module is a mezzanine card that mounts on top of the PowerEdge adapter card. The PowerEdge Battery Backup Module provides emergency battery power for the cache memory mounted on the PowerEdge adapter card..

Technical Support If you need technical assistance, see the "Getting Help" Chapter in the *Installation and Troubleshooting Guide* that accompanied your Dell computer.

Dell TechConnect BBS The TechConnect BBS permits you to access technical information about the Dell PowerEdge Expandable RAID Controller. For the correct BBS number in your area, see the "Getting Help" chapter in the *Installation and Troubleshooting Guide* that accompanied your Dell computer.

Web Site You can access the Dell Computer Corporation web site at:

`http://www.us.dell.com`

1   Installing the Battery Pack

Overview

The PowerEdge Battery Backup Module protects the data handled by the PowerEdge® Expandable RAID Controller by providing protection from power supply interruptions to the PowerEdge cache memory.

The PowerEdge Battery Backup Module monitors the voltage level of the DRAM modules installed on the PowerEdge card and supporting circuitry. If the voltage drops below a predefined level, the Battery Backup Module switches the memory power source from the PowerEdge card to the battery pack attached to the PowerEdge Battery Backup Module.

As long as the voltage level is below the predefined value, the PowerEdge Battery Backup Module provides the memory refresh cycles necessary to retain the contents of the PowerEdge memory modules.

If the voltage level returns to an acceptable level, the Battery Backup Module switches the power source back to the PowerEdge adapter card.
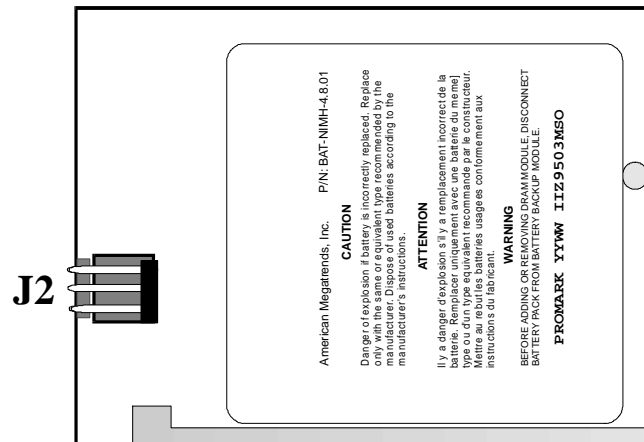
Battery Backup Module   The backup module is shown below. There are no jumpers to set. There are only two connectors that attach this daughtercard to the PowerEdge controller card. Two three-pin connectors (J1 and J2) attach the primary onboard battery pack and a secondary battery pack.

Bottom of board

J5

J6

Front of board

J2

American Megatrends, Inc.   P/N: BAT-NIMH-4.8.01

CAUTION

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

ATTENTION

Il y a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un type equivalent recommande par le constructeur. Mettre au rebut les batteries usagees conformement aux instructions du fabricant.

WARNING

BEFORE ADDING OR REMOVING DRAM MODULE, DISCONNECT BATTERY PACK FROM BATTERY BACKUP MODULE.

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Installing the Battery Backup Module

Static Electricity The PowerEdge PC SCSI Disk Array adapter card and the PowerEdge Battery Backup Module contain sensitive electronic components. Make sure you ground yourself by wearing an antistatic wristband or by maintaining contact with an electrical ground while you are installing the PowerEdge Battery Backup Module.

> ### *Warning*
>
> *Do not place the PowerEdge Battery Backup Module or the PowerEdge adapter card on a conductive surface while the battery is being attached or after the battery is attached.*

Installing Onboard Battery Pack

You should not have to install the onboard battery pack. It should already be mounted on the Dell PowerEdge Battery Backup Module.

> ### *Warning*
>
> *Before changing the memory on the PowerEdge card, you must disconnect the battery pack.*

Install the Battery Backup Card

Remove the PowerEdge card and place it on a flat, clean, static-free surface. Remove the four shunts from the 8-pin connector. Install the PowerEdge Battery Backup daughtercard on the PowerEdge adapter card as shown below.
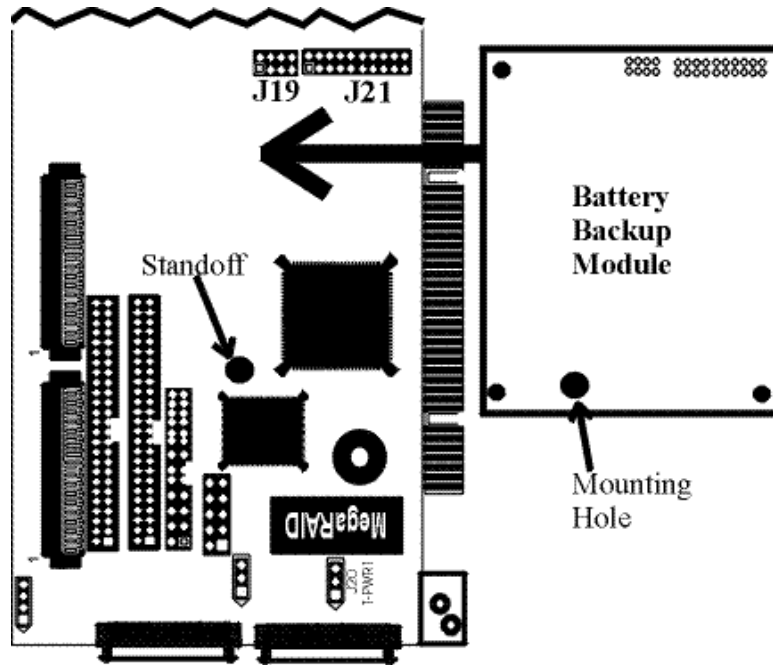
*(Only half of MegaRAID card is shown above).*

Warning

Do not place the PowerEdge Battery Backup Module or the PowerEdge adapter card on a conductive surface while the battery is being attached.

Cont'd

Attach Module to PowerEdge Controller Fasten the Battery Backup Module to the PowerEdge RAID controller using the **q**" screw and nylon washer supplied with the Battery Backup Module. First, insert the screw through the nylon washer. Then insert the screw through the hole on the PowerEdge controller, starting at the back of the PowerEdge controller. Next, tighten the screw into the threaded standoff on the Battery Backup Module. *The screw must not be as tight as you can make it.* Tighten the screw so that it is flush with the back of the PowerEdge controller, but not so tight that it cannot be turned anymore.

Side View of MegaRAID and Battery Backup Module

MegaRAID Card

Back

Nylon Screw

Standoff
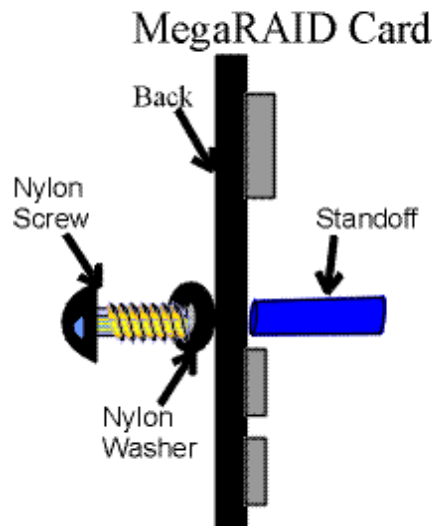
Nylon Washer

Insert the large 4-40 nylon screw through the nylon washer and through the mounting hole on the MegaRAID Card, starting from the back of the MegaRAID card.
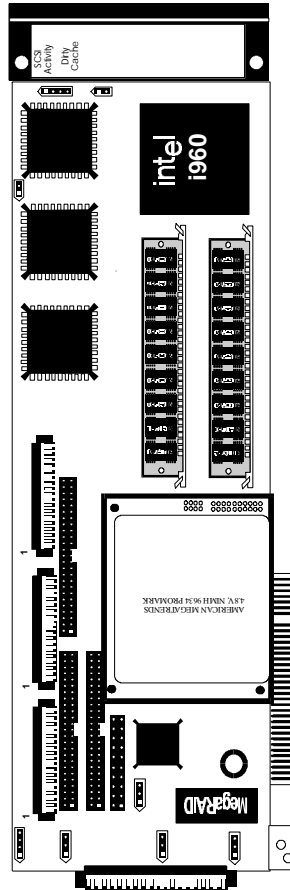
Thread the standoff on to the screw protruding from the hole.

Tighten the standoff and the screw.

Cont'd

The PERC with the PowerEdge Battery Backup Module installed on it should appear as follows:

See the *Dell PowerEdge RAID Controller User's Guide* for additional information about installing the PowerEdge Expandable RAID Controller.

Connecting Battery Packs

The PowerEdge Battery Backup Module usually is shipped with an onboard four-cell Nickel- Metal Hydride battery pack already installed. If this is the case, you must only insert the battery connector into J2, as shown below. The battery cable connector is keyed to make sure that the proper connection is made.

J2

Attach battery pack connector to J2
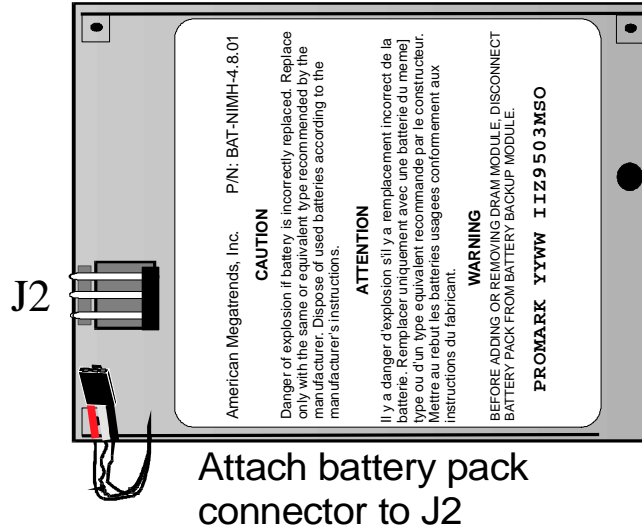
Install PowerEdge Card Install the PowerEdge card in the computer. See the *Dell PowerEdge RAID Controller User's Guide* for complete installation instructions.

PowerEdge Battery Backup Module User's Guide

2 Using the Battery Backup Module

Charging the Battery Pack

The battery pack is shipped uncharged. You must charge the battery pack before you can use it. The minimum time that the battery must be charged is:

AMI Part Number	Description	Time to Charge
BAT-NIMH-4.8-01	Battery, NIMH, 4.8V, 650mA onboard battery pack with mounting brackets	4 hours
BAT-NIMH-4.8-02	Battery, NIMH, 4.8, 1200mA external offboard battery pack	Primary - 12 hours (to 100%) Primary - 6 hours (to 90%) Secondary - 60 hours

The full data retention time is not available until the battery pack is fully charged. It is a good idea to set the PowerEdge cache write policy option *to Write-Through* during the battery pack charging period. After the battery pack is fully charged, you can change the cache write policy to *Write-Back*.

Removing the Battery Pack

A new battery pack should be installed in the battery backup module every 3 to 5 years.

Step	Action
1	Bring down the operating system properly. Make sure that cache memory has been flushed. You must perform a system reset if operating under DOS. When the computer reboots, the PowerEdge controller flushes cache memory.
2	Turn the computer power off.
3	Remove the computer cover.
4	Disconnect the battery pack from the battery backup module. Remove any other items that you want to remove, such as the battery backup module, PowerEdge controller, or DRAM modules.
5	Replace the computer cover and turn the computer power on.

Changing DRAM Modules

> ### *Important*
> ***The battery backup module must be disconnected before you add or remove DRAMs to or from the PowerEdge controller card.***

Step	Action
1	Bring down the operating system properly. Make sure that cache memory has been flushed. You must perform a system reset if operating under DOS. When the computer reboots, the PowerEdge controller flushes cache memory.
2	Turn the computer power off. Disconnect the power cables from the computer.
3	Remove the computer cover.
4	Disconnect the battery pack cable from the battery backup module.
5	Remove the PowerEdge controller.
6	You can now add or remove DRAM modules from the PowerEdge controller. Follow the instructions in the *PowerEdge RAID Controller User's Guide.*
7	Reinstall the PowerEdge controller in the computer. Follow the instructions in the *PowerEdge RAID Controller User's Guide.*
8	Reattach the battery pack cable to the battery backup module
9	Replace the computer cover and turn the computer power on.

Disposing of a Battery Pack

A new battery pack should be installed every 3 to 5 years. The material in the battery pack contains heavy metals that can contaminate the environment. Federal, state, and local regulations prohibit the disposal of NIMH batteries in public landfills. These batteries must be sent to a specific location for proper disposal. You can call the Rechargeable Battery Recycling Corporation at 352-376-6693 (FAX: 352-376-6658) for an authorized battery disposal site near you. For a list of battery disposal sites, write to:

Rechargeable Battery Recycling Corporation
2293 NW 41st Street
Gainesville FL 32606
Voice: 352-376-6693
FAX: 352-376-6658

3   Specifications

Fast Charge Rate   235 mA
Trickle Charge Rate   24 mA

Charge Time for Battery Packs   The following time-to-charge values are calculated assuming 80% efficiency in the charging process. The time-to-charge values may vary depending on individual battery packs.

AMI Part Number	Description	Time to Charge
BAT-NIMH-4.8-01	Battery, NIMH, 4.8V, 650mA onboard battery pack with mounting brackets	4 hours
BAT-NIMH-4.8-02	Battery, NIMH, 4.8, 1200mA external offboard battery pack	Primary - 12 hours (to 100%) Primary - 6 hours (to 90%) Secondary - 60 hours

Retention Time for Cache Memory The retention time for cache memory will vary with the SIMM size and number of DRAM SIMM banks used. See Appendix A for the data retention time.

Appendix A Data Retention Time

The data retention time is a function of:

- the capacity of the battery pack, and
- the load of the backed up circuitry.

Capacity and Load Factors The data retention time as a function of the battery pack capacity and load is listed below.

The load is the DRAM SIMM and the PERC Controller.

Battery Pack	DRAM Size	Data Retention Time
BAT-NIMH-4.8-01	1 Bank of 1 MBx36 (12 chips)	See the *Technical Update* shipped with the PERC or Dell Server.
	2 Banks of 1 MBx36 (12 chips)	
BAT-NIMH-4.8-02	1 Bank of 1 MBx36 (12 chips)	
	2 Banks of 1 MBx36 (12 chips)	

The information in this table is not complete. See the "Getting Help" Chapter in the *Installation and Troubleshooting Guide* that accompanied your Dell computer for additional information about technical support.